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**Rothamsted Experiments.**[1] — The present account by Lawes and Gilbert continues the results derived from forty-four years of continuous experimentation upon the same land. The general results so far reached show very characteristic differences in the composition of the ashes of different crops according to the amount of nitrogen they assimilated; and upon this is based the conclusion that "independently of any specially physiological function of the bases, such as that of potash with the formation of carbohydrates, their office was prominently also that of *carriers of nitric acid*, and that when the nitrogen had been assimilated, the base was left as a residue in combination with organic acid, which, according to the character of the plant, was represented more or less completely by carbonic acid in the ash."

D. P. P.

**Plants in Calcareous Tufa.**[2] — Mr. J. M. Hulth presents an interesting study of the plants found in the calcareous tufa of western Gothland in the region of Falköping and Sköfde, and discusses the vegetation of seven different horizons with respect to their relation to the flora of the Arctic, Boreal, and Atlantic periods. The vegetation found corresponds with existing types.

D. P. P.

**Fossil Flora of the Cascade Range.**[3] — Studies of the fossil plants associated with the lavas of the Cascade Range, prosecuted during the last five years, have been completed by Professor F. H. Knowlton. Twenty-eight forms in all are described, and they include such types as have hitherto been found in the Miocene only, from which the author concludes unhesitatingly that the beds are of Miocene age.

D. P. P.

**Flora of the Coal Layers of Lâ Ternera.**[4] — Solms-Laubach presents a short account of the plants derived from the Coal Formation at La Ternera, Chili. Ten species of gymnosperms and ferns are enumerated, and they serve to indicate that the beds belong to the Lower Lias.

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[1] Lawes, Sir J. B., and Gilbert, Sir J. H. Agricultural, Botanical, and Chemical Results of Experiments on the Mixed Herbage of Permanent Grass Land; III, Chemical Results, *Phil. Trans. R. Soc.*, vol. cxcii (1900), pp. 139–210.

[2] Hulth, J. M. Ueber einige Kalktuffe aus Westergötland, *Bull. Geol. Inst. of Upsala*, 1898, vol. iv, pp. 5–40, Pl. I.

[3] Knowlton, F. H. Report on the Fossil Plants associated with the Lavas of the Cascade Range, *U. S. Geol. Surv.*, vol. xx, III, 1898–99, pp. 37–52, Pls. I–VI.

[4] Solms-Laubach, H. von Grafen zu. *Neue Jahrb. f. Mineral.*, etc., vol. xii, 1899, pp. 581–609, Pls. XIII, XIV.

D. P. P.

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## PALEONTOLOGY.

**Notes on Fossil Fishes.**—In the *Bulletin of the Geological Society of America* Mr. C. R. Eastman has an account of the fossil fishes of Jurassic formations in the Black Hills of South Dakota. The paper is supplementary to one by N. H. Darton on the same subject. The Jura-Trias of America has yielded very few fishes, and the scanty remains noted by Mr. Darton and Mr. Eastman represent about all that is known of the fish fauna of the period as represented in American deposits. In the present paper are given descriptions and photographic representations of *Pholidophorus americanus* and *Amiopsis* (?) *dartoni*. The relations of Pholidophorus are discussed in some detail, it being regarded as the type of a distinct family, Pholidophoridæ.

In the *Memoirs of the New York Academy of Sciences* Dr. Bashford Dean discusses the relationships of the alleged fossil lamprey of the Devonian, *Palæospondylus gunni*. In Dr. Dean's view this species is not a lamprey, nor related to the cyclostomes. It is probably a larval form, possibly of the Arthrodira genus Coccosteus. The Arthrodira, according to Dr. Dean, "cannot be strictly included among the fishes," and with their relatives (Anarthrodira), all also extinct, should be placed in a distinct class, Arthrognathi, by themselves.

In the *Journal of Geology* Mr. C. R. Eastman describes and figures the teeth of a number of Devonian fishes, the following being described as new: *Cladodus monroei*, from the Hamilton formation at Milwaukee; *Dipterus uddeni* and *D. calvini*, from the Middle Devonian, New Buffalo, Iowa; *D. costatus* and *D. mordax*, from North Liberty, Iowa.

D. S. J.

A slab of limestone with numerous specimens of *Uintacrinus socialis* Grinnell, recently placed on exhibition in the Yale University Museum, is noticed and figured in the April number of the *American Journal of Science*. A similar and somewhat larger slab in the Museum of Comparative Zoölogy is figured in the Annual Report of the Museum for 1898–99.